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ART UNIT	PAPER NUMBER
2447	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/772,138	AHMED ET AL.	
	Examiner	Art Unit	
	SHERMAN LIN	2447	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *See Continuation Sheet* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *See Continuation Sheet* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 1-3,5,6,8,10,13,15-21,23,24,26,28,31,33-39,41,42,44,46,49,51-57,59,60,62-66,68,69,71-73,75,76,78,79,81,84,86-89,91,94,96-99,101,104,106 and 107.

Continuation of Disposition of Claims: Claims rejected are 1-3,5,6,8,10,13,15-21,23,24,26,28,31,33-39,41,42,44,46,49,51-57,59,60,62-66,68,69,71-73,75,76,78,79,81,84,86-89,91,94,96-99,101,104,106 and 107.

DETAILED ACTION

1. In a communication received on 15 December 2009, applicants amended claims 37, 64, 71, 88 and 98.

2. Claims 1-3, 5, 6, 8, 10, 13, 15-21, 23, 24,26, 28, 31, 33-39, 41, 42, 44, 46, 49, 51-57, 59, 60, 62-66, 68, 69, 71-73, 75, 76, 78, 79, 81, 84, 86-89, 91, 94, 96-99, 101, 104, 106 and 107 are pending.

Response to Arguments

3. Applicant's arguments filed 15 December 2009 have been fully considered but they are not persuasive.

A. With respect to Remarks on page 42 paragraph 1, applicant argues that the ping command of Elliott is a single command which cannot compare **"the arrival times of two distinct commands."**

The examiner respectfully traverses:

With respect to arguments regarding claim 1, Elliott teaches the following limitations:

determining a current time at which the message was received (i.e., pinging each candidate gateway uses times that messages are received for evaluating latency in col. 98 lines 24-29; wherein the arrival time of a message is inherent to calculating the latency or round-trip time in a ping command; thus, the ping command determines the difference between an arrival time of a reply from the pinged candidate gateway and the time when a ping was initiated, in order to calculate latency);

retrieving a gateway time at which a message from the gateway CCA was received (i.e., IP ping evaluates the time it takes for a message to take a round-trip from the gateway to the client in col. 98 lines 42-44; list of gateways pinged can include the current gateway selected in col. 98 lines 33-35; wherein retrieving the time a message is received from a candidate gateway is inherent to calculating latency in a ping command); and

selecting and assigning a new gateway CCA based upon a result of a formula for comparing the current time and the gateway time (i.e., selecting the best choice for a gateway server in col. 97 lines 64-65; ranking the pinged gateways in order of lowest latency in col. 98 lines 53-54; wherein comparing a current time and a gateway time is inherent in comparing the latencies of the pinged gateways; furthermore, the latencies of the pinged gateways indicate the time a reply is received from a gateway in relation to the initiation of a ping command).

The applicants' arguments, although considered, are not persuasive because retrieving the arrival time of a message from a candidate gateway or a current gateway is inherent to the ping command without modification.

For the sake of compact prosecution, the Examiner notes that the limitations discussed above appear to be the CCA-capable node-Initiated and Proactive embodiment disclosed on pages 27-28 section (d) of the applicants' original disclosure. In section 109, applicants disclosed the comparison formula explicitly as T_{last} < (current_time – 2*(T_1)). Furthermore, the embodiment requires use of an application specific time period, T_1. Examiner advises applicants to specifically claim the steps of the formula such that future amendments would require further search and/or consideration upon filing a response to this office action.

Claim Objections

4. Claims 2, 5, 8, 55, 78, 88 and 98 are objected to because of the following informalities:

- In claim 2 line 3, "determine whether it is active" should be "determine whether the gateway CCA is active";
- In claim 5 lines 3-4, "determine whether they are active" should be "determine whether the plurality of CCA-capable nodes are active";

- In claim 8 lines 4-5, "list to determine its state" should be "list to determine the state of each CCA-capable node";
- In claim 55 line 4, "a plurality of CCA-capable nodes" should be "a plurality of cross layer communication agent capable nodes, herein referred to as CCA-capable nodes";
- In claim 78 line 3, "a CCA-capable node" should be "a cross layer communication agent capable node, herein referred to as CCA-capable node";
- In claim 88 line 1, "a CCA-capable node" should be "a cross layer communication agent capable node, herein referred to as CCA-capable node"; and
- In claim 98 lines 1-2, "a CCA-capable node" should be "a cross layer communication agent capable node, herein referred to as CCA-capable node".

Appropriate correction is required.

Claim Rejections - 35 USC § 101

5. A "computer-readable medium" in claims 37, 71, and 98 is interpreted as a medium limited to a non-transitory medium.

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 64-66, 68-69, 88-89, 91, 94, and 96-97 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 64 lacks the necessary physical articles or objects to constitute a machine, manufacture, process, or a composition of matter within the meaning of 35 U.S.C. 101. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, the claim fails to fall within a statutory category. It is, at best, functional descriptive material *per se*. Claims 65-66 and 68-69 are likewise rejected.

Claim 88 lacks the necessary physical articles or objects to constitute a machine, manufacture, process, or a composition of matter within the meaning of 35 U.S.C. 101. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, the claim fails to fall within a statutory category. It is, at best, functional descriptive material *per se*. Claims 89, 91, 94, 96-97 are likewise rejected.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-3, 5-6, 8, 10, 17-18, 19, 20-21, 23-24, 26, 28, 35-39, 41-42, 44, 46, 53-57, 59-60, 62-66, 68-69, 71-73, 75-76, 78-79, 81, 88-89, 91, 98-99, and 101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corson et al. ("Internet-Based Mobile Ad Hoc Networking", IEEE Internet Computing, July-August 1999, pages 63-70) in view of Novaes (US Patent No. 6,732,189 B1), and further in view of Elliott et al. (US Patent No. 6,335,927 B1).

[Claim 1] Corson teaches a method for increasing the fault tolerance in a network, said method comprising acts of:

associating a plurality of nodes with a sub-network, each of said plurality of nodes capable of sending and receiving data (i.e., nodes with wireless transmitters and receivers have wireless connectivity in an ad hoc network on page 64 left column lines 1-10);

adding a plurality of cross layer communication agent capable nodes, herein referred to as CCA-capable nodes, to said sub-network, said plurality of CCA-capable nodes capable of receiving data from and sending data to said plurality of nodes (i.e., mobile router interfaces with a fixed router from a fixed network and facilitates routing of communication between mobile nodes on page 65 right column lines 6-14 and fig. 2); and

Corson does not teach determining an assignment for a gateway CCA. Novaes, in order to elect a new subnetwork leader for a multicast unreachable subnetwork (see col. 4 lines 55-58), teaches

determining which one of the plurality of CCA-capable nodes to assign as a gateway CCA (i.e., determining which node in a subnetwork is available to become a subnetwork leader in col. 9 lines 16-18), whereby said gateway CCA is used by each one of said plurality of nodes within said sub-network (i.e., only one subnetwork leader in a subnetwork receiving and processing messages from nodes on col. 9 lines 29-31) to communicate with the rest of the network (i.e., maintaining reachability of nodes for multicast communications in col. 4 lines 39-44); wherein

the act of determining further comprises acts of:

designating one of the plurality of CCA-capable nodes to be a gateway CCA (i.e., electing a network leader by calculating a gravitational weight in col. 14 lines 48-56);

broadcasting a message from each CCA-capable node to the plurality of nodes (i.e., IP trace routing messages sent to calculate the number of "hops" to each node during runtime in col. 15 lines 53-60); and

selecting a gateway CCA based upon the message from each CCA-capable node (i.e., a network leader is chosen based on metric in col. 14 lines 48-56; and the metric of hops is applied to calculating a gravitational center of a network in col. 14 lines 61-67).

Based on Corson in view of Novaes, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Novaes to improve upon those of Corson in order to elect a new subnetwork leader for a multicast unreachable subnetwork.

Corson and Novaes do not teach determining or retrieving a gateway time and selecting a new gateway based on a comparison of these times. Elliott, in order to route information through a hybrid network utilizing telephony routing information and internet protocol address information (see col. 1 lines 24-29), teaches wherein the act of selecting further comprises acts of:

determining a current time at which the message was received (i.e., pinging each candidate gateway uses times that messages are received for evaluating latency in col. 98 lines 24-29; wherein the arrival time of a message is inherent to calculating the latency or round-trip time in a ping command; thus, the ping command determines the difference between an arrival time of a reply from the pinged candidate gateway and the time when a ping was initiated, in order to calculate latency);

retrieving a gateway time at which a message from the gateway CCA was received (i.e., IP ping evaluates the time it takes for a message to take a round-trip from the gateway to the client in col. 98 lines 42-44; list of gateways pinged can include the current gateway selected in col. 98 lines 33-35; wherein retrieving the time a message is received from a candidate gateway is inherent to calculating latency in a ping command); and

selecting and assigning a new gateway CCA based upon a result of a formula for comparing the current time and the gateway time (i.e., selecting the best choice for a gateway server in col. 97 lines 64-65; ranking the pinged gateways in order of lowest latency in col. 98 lines 53-54; wherein comparing a current time and a gateway time is inherent in comparing the latencies of the pinged gateways; furthermore, the latencies of the pinged gateways indicate the time a reply is received from a gateway in relation to the initiation of a ping command).

Based on Corson in view of Novaes, and further in view of Elliott, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Elliott to improve upon those of Corson in order to route information through a hybrid network utilizing telephony routing information and internet protocol address information.

[Claim 2] Corson does not teach querying a gateway CCA or assigning a new gateway CCA. Novaes further teaches the method wherein the act of determining the assignment of the gateway CCA further comprises sub-acts of:

querying the gateway CCA from each node to determine whether it is active and awaiting a response (i.e., beacon messages are sent to the subnetwork leader in col. 9 lines 26-31; the node can expect a master list message from the subnetwork leader node as response, which indicates it is active and also listening for beacon messages in col. 10 lines 37-41), and when:

the gateway CCA responds, repeating the querying act (i.e., the subnetwork leader continues to listen for and expect beacon messages and in response, sends master list messages in col. 10 lines 43-47); otherwise,

broadcasting a solicit message for receipt by CCA-capable nodes and awaiting a response (i.e., nodes can negotiate an election of a new leader by exchanging beacon messages with each other in col. 9 lines 18-22), and when:

a CCA-capable node responds, assigning a CCA-capable node as the gateway CCA (i.e., a node can respond by asserting its subnetwork leader status in col. 10 lines 65-67); otherwise,

repeating the broadcasting act (i.e., the beacon nodes exchange messages with other nodes continually in col. 11 lines 20-28).

Therefore, the limitations of claim 2 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 3] Corson does not teach selecting a single CCA-capable node as the gateway for all nodes. Novaes further teaches the method wherein

when a plurality of CCA-capable nodes respond, selecting from the plurality of CCA-capable nodes responding, a single CCA-capable node for use by all of the nodes as the gateway CCA (i.e., nodes exchange beacon message

responses to each other, wherein only one of those nodes in a subnetwork is tasked with the leader role in normal operation in col. 9 lines 19-23).

Therefore, the limitations of claim 3 are rejected in the analysis of claim 2 above, and the claim is rejected on that basis.

[Claim 5] Corson does not teach querying a CCA-capable node for activity or changing a gateway CCA assignment. Novaes further teaches the method wherein said act of determining further comprises acts of:

querying the plurality of CCA-capable nodes, from each node, to determine whether they are active and awaiting a response (i.e., beacon messages are sent to the subnetwork leader in col. 9 lines 26-31; the node can expect a master list message from the subnetwork leader node indicating it is active and also listening for beacon messages in col. 10 lines 37-41), and when:

the gateway CCA responds, repeating the querying act (i.e., the subnetwork leader continues to listen for and expect beacon messages and in response sends master list messages in col. 10 lines 43-47); otherwise,

changing the CCA-capable node assigned to be the gateway CCA based upon a response from the plurality of CCA-capable nodes (i.e., a node can respond by asserting its subnetwork leader status in col. 10 lines 65-67).

Therefore, the limitations of claim 5 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 6] Corson does not teach selecting a single gateway CCA for use by all the nodes in a subnetwork. Novaes further teaches the method wherein

when a plurality of CCA-capable nodes respond, selecting from the plurality of CCA-capable nodes responding, a single CCA-capable node for use by all of the nodes as the gateway CCA (i.e., only one node in a subnetwork is tasked with the leader role in normal operation in col. 9 lines 19-23).

Therefore, the limitations of claim 6 are rejected in the analysis of claim 5 above, and the claim is rejected on that basis.

[Claim 8] Corson does not teach compiling or updating a list of CCA-capable nodes or selecting a new gateway CCA. Novaes further teaches the method wherein said act of determining further comprises acts of:

compiling a list of CCA-capable nodes on at least one CCA-capable node (i.e., compiling a master list or host address list in col. 13 lines 62-64; and host address list contains identifications of subnetwork leaders in col. 6 lines 9-12);

querying each CCA-capable node, from at least one CCA-capable node, in the list to determine its state (i.e., using a host address list to periodically query the reachability of subnetwork leaders in col. 18 lines 30-33);

updating the list of CCA-capable nodes based on a response from each of the CCA-capable nodes (i.e., after receiving a periodic subnetwork list message, the network leader compiles the master list whenever it receives a periodic message from subnetwork leaders in col. 13 lines 59-64); and

checking for a response from the gateway CCA (i.e., monitor the health of a tier leader in step 1220 of fig. 12), and when:

the gateway CCA responds, repeating the querying act (i.e., monitoring the health of a tier leader leads back to step 1208 in fig. 12); otherwise,

transmitting the list of CCA-capable nodes to the plurality of nodes in the sub-network (i.e., subnetwork leaders propagate the master list to all the nodes in their networks in col. 13 lines 65-67); and

selecting and assigning a new gateway CCA from the list of CCA capable nodes (i.e., if all nodes are capable of being a gateway CCA, the configuration file is a list of all these nodes such that a network leader is elected amongst them in col. 14 lines 52-56 and table 1).

Therefore, the limitations of claim 8 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 10] Corson does not teach querying or updating a list in order to select a new gateway CCA. Novaes further teaches the method wherein the act of determining further comprises acts of:

querying each CCA-capable node, from at least one CCA-capable node, in the plurality of CCA-capable nodes to determine its state (i.e., querying other subnetwork leaders until all reachable subnetwork leaders have been queried in col. 15 lines 6-14);

updating a list of CCA-capable nodes, stored on the at least one CCA capable node, based on a response from each of the CCA-capable nodes (i.e., after receiving a periodic subnetwork list message, the network leader compiles the master list whenever it receives a periodic message from subnetwork leaders in col. 13 lines 59-64);

sending, from the at least one CCA-capable node, the list of CCA-capable nodes to the plurality of nodes in the sub-network (i.e., subnetwork leaders propagate the master list to all the nodes in their networks in col. 13 lines 65-67);

waiting to repeat the querying act (i.e., periodically monitoring the reachability of a subnetwork leader in col. 18 lines 32-33); and

checking, by at least one node in the plurality of nodes, the list of CCA capable nodes for the gateway CCA (i.e., querying other subnetwork leaders for a network leader in col. 15 lines 6-14; subnetwork leaders are multicast reachable from the list of nodes in col. 13 lines 44-48), and when:

the gateway CCA is in the list of CCA-capable nodes, said at least one node waiting for the next list of CCA-capable nodes (i.e.,

subnetwork leaders expect to receive master list message from the confirmed network leader in col. 13 lines 59-68); otherwise,

selecting and assigning a new gateway CCA from the list of CCA-capable nodes (i.e., if all the nodes in a list are capable of being a gateway CCA, electing a new network leader from one of the nodes in a configuration file in col. 14 lines 48-56 and table 1).

Therefore, the limitations of claim 10 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 17] Corson further teaches the method wherein the act of associating the plurality of nodes further comprises an act of associating the plurality of nodes in an ad-hoc manner (i.e., nodes with wireless transmitters and receivers have wireless connectivity in an ad hoc network on page 64 left column lines 1-10). Therefore, the limitations of claim 17 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 18] Corson further teaches the method further comprising an act of providing at least a portion of the plurality of nodes and CCA-capable nodes that are able to be mobile (i.e., mobile routers and mobile nodes on page 65 right column lines 6-14 and fig. 2). Therefore, the limitations of claim 18 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 19] The limitations of claim 19 are similar to the limitations of claim 1. Corson further teaches a network comprising:

a plurality of nodes forming a first sub-network (i.e., nodes with wireless transmitters and receivers have wireless connectivity in an ad hoc network on page 64 left column lines 1-10);

said plurality of CCA-capable nodes capable of communicating with the plurality of nodes and capable of communicating with a second sub-network (i.e., a mobile router interfaces with a fixed router from a fixed network and facilitates routing of communication between mobile nodes on page 65 right column lines 6-14 and fig. 2).

Corson does not teach determining an assignment for a gateway CCA. Novaes further teaches:

the plurality of nodes and the plurality of CCA-capable nodes communicate to determine which CCA-capable node to assign as a gateway CCA (i.e., determining which node in a subnetwork is available to become a subnetwork leader in col. 9 lines 16-18), whereby the gateway CCA is used by each one of the plurality of nodes and the remaining CCA-capable nodes (i.e., only one subnetwork leader in a subnetwork receiving and processing messages from nodes on col. 9 lines 29-31) to communicate with the second sub-network (i.e., maintaining reachability of nodes for multicast communications in col. 4 lines 39-44);

Therefore, the limitations of claim 19 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 20] The limitations of claim 20 are similar to the limitations of claim 2. Corson does not teach a designating message. Novaes further teaches the network further comprising:

a designation message for designating one of the plurality of CCA-capable nodes as the gateway CCA (i.e., send a message to the group asserting subnetwork leader status in col. 10 lines 65-67); and

a timeout period where each node waits for a response from the gateway CCA (i.e., beacon node determines whether it has heard from the subnetwork leader within some interval in col. 10 lines 41-43).

Therefore, the limitations of claim 20 are rejected in the analysis of claim 2 above, and the claim is rejected on that basis.

[Claim 21] The limitations of claim 21 are similar to the limitations of claim 3. Therefore, claim 21 is rejected with the same reasoning as claim 3.

[Claim 23] The limitations of claim 23 are similar to the limitations of claim 5. Corson does not teach designating a node as a gateway. Novaes further teaches the network further comprising:

a designation message for designating one of the plurality of CCA-capable nodes to be a gateway CCA (i.e., send a message to the group asserting subnetwork leader status in col. 10 lines 65-67);

a timeout period where each node waits for a response from each of the plurality of CCA-capable nodes (i.e., a node waits for a response from a subnetwork leader within some interval in col. 10 lines 40-43).

Therefore, the limitations of claim 23 are rejected in the analysis of claim 5 above, and the claim is rejected on that basis.

[Claim 24] the limitations of claim 24 are similar to the limitations of claim 6. Therefore, claim 24 is rejected with the same reasoning as claim 6.

[Claim 26] the limitations of claim 26 are similar to the limitations of claim 8. Corson does not teach a designation message. Novaes further teaches the network further comprising:

a designation message for designating one of the plurality of CCA-capable nodes to be a gateway CCA (i.e., send a message to the group asserting subnetwork leader status in col. 10 lines 65-67).

Therefore, the limitations of claim 26 are rejected in the analysis of claim 8 above, and the claim is rejected on that basis.

[Claim 28] The limitations of claim 28 are similar to the limitations of claim 10. Corson does not teach designating a node as a gateway. Novaes further teaches the network further comprising:

a designation instruction block, on at least one CCA-capable node of the plurality of CCA-capable nodes, for designating one of the plurality of CCA capable nodes to be a gateway CCA (i.e., election of a network leader in col. 14 lines 48-56).

Therefore, the limitations of claim 28 are rejected in the analysis of claim 10 above, and the claim is rejected on that basis.

[Claim 35] The limitations of claim 35 are similar to the limitations of claim 17. Therefore, claim 35 is rejected with the same reasoning as claim 17.

[Claim 36] The limitations of claim 36 are similar to the limitations of claim 18. Therefore, claim 36 is rejected with the same reasoning as claim 18.

[Claim 37] The limitations of claim 37 are similar to the limitations of claim 1. Therefore, claim 37 is rejected with the same reasoning as claim 1.

[Claim 38] The limitations of claim 38 are similar to the limitations of claim 2. Therefore, claim 38 is rejected with the same reasoning as claim 2.

[Claim 39] The limitations of claim 39 are similar to the limitations of claim 3. Therefore, claim 39 is rejected with the same reasoning as claim 3.

[Claim 41] The limitations of claim 41 are similar to the limitations of claim 5. Therefore, claim 41 is rejected with the same reasoning as claim 5.

[Claim 42] The limitations of claim 42 are similar to the limitations of claim 6. Therefore, claim 42 is rejected with the same reasoning as claim 6.

[Claim 44] The limitations of claim 44 are similar to the limitations of claim 8. Therefore, claim 44 is rejected with the same reasoning as claim 8.

[Claim 46] the limitations of claim 46 are similar to the limitations of claim 10. Therefore, claim 46 is rejected with the same reasoning as claim 10.

[Claim 53] The limitations of claim 53 are similar to the limitations of claim 17. Therefore, claim 53 is rejected with the same reasoning as claim 17.

[Claim 54] The limitations of claim 54 are similar to the limitations of claim 18. Therefore, claim 54 is rejected with the same reasoning as claim 18.

[Claim 55] The limitations of claim 55 are similar to the limitations of claim 1. Corson further teaches a method for network communications, the method comprising actions of:

associating a node with a sub-network, the node capable of sending data to and receiving data from a plurality of CCA-capable nodes (i.e., nodes with wireless transmitters and receivers have wireless connectivity in an ad hoc network on page 64 left column lines 1-10).

Therefore, the limitations of claim 55 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 56] The limitations of claim 56 are similar to the limitations of claim 2. Therefore, claim 56 is rejected with the same reasoning as claim 2.

[Claim 57] The limitations of claim 57 are similar to the limitations of claim 3. Therefore, claim 57 is rejected with the same reasoning as claim 3.

[Claim 59] The limitations of claim 59 are similar to the limitations of claim 5. Therefore, claim 59 is rejected with the same reasoning as claim 5.

[Claim 60] The limitations of claim 60 are similar to the limitations of claim 6. Therefore, claim 60 is rejected with the same reasoning as claim 6.

[Claim 62] The limitations of claim 62 are similar to the limitations of claim 17. Therefore, claim 62 is rejected with the same reasoning as claim 17.

[Claim 63] The limitations of claim 63 are similar to the limitations of claim 18. Therefore, claim 63 is rejected with the same reasoning as claim 18.

[Claim 64] The limitations of claim 64 are similar to the limitations of claim 1. Corson further teaches a node comprising:

a data processing system executing one or more instruction blocks (i.e., a laptop or handheld computer on page 63 3rd paragraph line 5) wherein said instruction blocks comprise:

a transmitting and receiving instruction block for communicating with a sub-network (i.e., nodes with wireless transmitters and receivers have wireless

connectivity in an ad hoc network on page 64 left column lines 1-10), the sub-network comprising of nodes and a plurality of cross layer communication agent capable nodes, herein referred to as CCA-capable nodes (i.e., mobile routers interface with a fixed router from a fixed network and also facilitate routing of communication between mobile nodes on page 65 right column lines 6-14 and fig. 2); and

the gateway CCA is used by the node to communicate with a second sub-network (i.e., a mobile node is connected to a mobile router which interfaces with a fixed router from a fixed network on page 65 right column lines 6-14 and fig. 2).

Therefore, the limitations of claim 64 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 65] The limitations of claim 65 are similar to the limitations of claim 2. Corson does not teach designating a node as a gateway. Novaes further teaches the node wherein the determination instruction block further comprises:

a designation instruction block for designating one of the plurality of CCA capable nodes as the gateway CCA (i.e., determine an available node can become a subnetwork leader based on it having the highest or lowest network address in col. 9 lines 13-18); and

a timeout period where the node waits for a response from the gateway CCA (i.e., beacon node determines whether it has heard from the subnetwork leader within some interval in col. 10 lines 41-43).

Therefore, the limitations of claim 65 are rejected in the analysis of claim 2 above, and the claim is rejected on that basis.

[Claim 66] The limitations of claim 66 are similar to the limitations of claim 3. Therefore, claim 66 is rejected with the same reasoning as claim 3.

[Claim 68] The limitations of claim 68 are similar to the limitations of claim 5. Corson does not teach designating a node as a gateway or a timeout period. Novaes further teaches the node wherein the determination instruction block further comprises:

a designation message for designating one of the plurality of CCA-capable nodes to be a gateway CCA (i.e., send a message to the group asserting subnetwork leader status in col. 10 lines 65-67); and

a timeout period where the node waits for a response from each of the plurality of CCA-capable nodes (i.e., beacon node determines whether it has heard from the subnetwork leader within some interval in col. 10 lines 41-43).

Therefore, the limitations of claim 68 are rejected in the analysis of claim 5 above, and the claim is rejected on that basis.

[Claim 69] The limitations of claim 69 are similar to the limitations of claim 6. Therefore, claim 69 is rejected with the same reasoning as claim 6.

[Claim 71] The limitations of claim 71 are similar to the limitations of claim 1. Corson further teaches a computer-readable medium having computer- executable instructions for causing a computer to perform operations of:

associating the node with a sub-network, the node capable of sending and receiving data to and from a plurality of CCA-capable nodes (i.e., nodes with wireless transmitters and receivers have wireless connectivity in an ad hoc network on page 64 left column lines 1-10).

Therefore, the limitations of claim 71 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 72] The limitations of claim 72 are similar to the limitations of claim 2. Therefore, claim 72 is rejected with the same reasoning as claim 2.

[Claim 73] The limitations of claim 73 are similar to the limitations of claim 3. Therefore, claim 73 is rejected with the same reasoning as claim 3.

[Claim 75] The limitations of claim 75 are similar to the limitations of claim 5. Therefore, claim 75 is rejected with the same reasoning as claim 5.

[Claim 76] The limitations of claim 76 are similar to the limitations of claim 6. Therefore, claim 76 is rejected with the same reasoning as claim 6.

[Claim 78] The limitations of claim 78 are similar to the limitations of claim 1. Corson further teaches a method for network communications, the method comprising acts of:

associating a CCA-capable node with a sub-network, the sub-network comprising a plurality of CCA-capable nodes, the CCA-capable node capable of sending and receiving data to and from nodes within the sub-network (i.e., mobile router interfaces with a fixed router from a fixed network and facilitates routing of communication between mobile nodes on page 65 right column lines 6-14 and fig. 2).

Therefore, the limitations of claim 78 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 79] The limitations of claim 79 are similar to the limitations of claim 8. Therefore, claim 79 is rejected with the same reasoning as claim 8.

[Claim 81] The limitations of claim 81 are similar to the limitations of claim 10. Therefore, claim 81 is rejected with the same reasoning as claim 10.

[Claim 88] The limitations of claim 88 are similar to the limitations of claim 1. Corson further teaches a CCA-capable node comprising:

a data processing system executing one or more instruction blocks (i.e., a laptop or handheld computer on page 63 3rd paragraph line 5).

Therefore, the limitations of claim 88 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

[Claim 89] The limitations of claim 89 are similar to the limitations of claim 8. Corson does not teach designating a node as a gateway. Novaes further teaches the CCA-capable node wherein the determination instruction block further comprises:

a designation message for designating one of the plurality of CCA-capable nodes to be a gateway CCA (i.e., send a message to the group asserting subnetwork leader status in col. 10 lines 65-67);

Therefore, the limitations of claim 89 are rejected in the analysis of claim 8 above, and the claim is rejected on that basis.

[Claim 91] The limitations of claim 91 are similar to the limitations of claim 10. Corson does not teach designating a node as a gateway. Novaes further teaches the CCA-capable node further comprising:

a designation instruction block for designating one of the plurality of CCA-capable nodes to be a gateway CCA (i.e., election of a network leader in col. 14 lines 48-56);

a compiling instruction block for compiling a list of CCA-capable nodes based on a response from each of the CCA-capable nodes (i.e., after receiving a

periodic subnetwork list message, the network leader compiles the master list whenever it receives a periodic message from subnetwork leaders in col. 13 lines 59-64);

Therefore, the limitations of claim 91 are rejected in the analysis of claim 10 above, and the claim is rejected on that basis.

[Claim 98] The limitations of claim 98 are similar to the limitations of claim 1. Therefore, claim 98 is rejected with the same reasoning as claim 1.

[Claim 99] The limitations of claim 99 are similar to the limitations of claim 8. Therefore, claim 99 is rejected with the same reasoning as claim 8.

[Claim 101] The limitations of claim 101 are similar to the limitations of claim 10. Therefore, claim 101 is rejected with the same reasoning as claim 10.

10. Claims 13, 31, 49, 84, 94, and 104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corson et al. ("Internet-Based Mobile Ad Hoc Networking", IEEE Internet Computing, July-August 1999, pages 63-70) in view of Novaes (US Patent No. 6,732,189 B1) and Elliott et al. (US Patent No. 6,335,927 B1), and further in view of Chari et al. (US Application No. 2002/0107023 A1).

[Claim 13] Corson does not teach determining or comparing hop-counts. Novaes, in order to elect a new subnetwork leader for a multicast unreachable

subnetwork (see col. 4 lines 55-58), teaches the method wherein the act of selecting comprises acts of:

determining a current hop-count for the message (i.e., IP trace routing facility used to calculate the number of "hops" during runtime in col. 15 lines 53-60).

Based on Corson in view of Novaes, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Novaes to improve upon those of Corson in order to elect a new subnetwork leader for a multicast unreachable subnetwork.

Corson, Novaes, and Elliott do not teach comparing hop-counts to previous ones for selecting a new gateway. Chari, in order for wireless clients to receive a beacon and know the way to reach a server (see section 8 lines 5-6), teaches

comparing the current hop-count to previous hop-counts from previous messages (i.e., comparing the number of hops between a client and server in section 98 lines 1-3), and

when the current hop-count is less than the previous hop-count selecting the CCA- capable node which broadcast the message as a new gateway CCA; instead of based upon a result of a formula for comparing the current time and the gateway time (i.e., optimal path to a server maybe chosen based on preset criteria such as number of hops determined from previous beacon messages to a server in section 99 lines 1-2 and 13-15).

Based on Corson in view of Novaes and Elliott, and further in view of Chari, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Chari to improve upon those of Corson in order for wireless clients to receive a beacon and know the way to reach a server.

[Claim 31] The limitations of claim 31 are similar to the limitations of claim 13. Therefore, claim 31 is rejected with the same reasoning as claim 13.

[Claim 49] The limitations of claim 49 are similar to the limitations of claim 13. Therefore, claim 49 is rejected with the same reasoning as claim 13.

[Claim 84] The limitations of claim 84 are similar to the limitations of claim 13. Therefore, claim 84 is rejected with the same reasoning as claim 13.

[Claim 94] The limitations of claim 94 are similar to the limitations of claim 13. Therefore, claim 94 is rejected with the same reasoning as claim 13.

[Claim 104] The limitations of claim 104 are similar to the limitations of claim 13. Therefore, claim 104 is rejected with the same reasoning as claim 13.

11. Claims 15-16, 33-34, 51-52, 86-87, 96-97, and 106-107 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corson et al. (“Internet-Based Mobile Ad Hoc

Networking", IEEE Internet Computing, July-August 1999, pages 63-70) in view of Novaes (US Patent No. 6,732,189 B1) and Elliott et al. (US Patent No. 6,335,927 B1), and further in view of Kursawe et al. (US Application No. 2001/0025351 A1) and Lisiecki et al. (US Application 2002/0143888 A1).

[Claim 15] Corson, Novaes, and Elliott do not teach a system of voting which elects a new leader. Kursawe, in order to use a fault-tolerant consensus protocol to propose an action required to be coordinated with all other processors of the system (see section 2 lines 3-6), teaches the method wherein said act of determining further comprises acts of:

transmitting a vote from each CCA-capable node to all other CCA-capable nodes identifying which CCA-capable node has been designated a subsequent gateway CCA (i.e., all participants sending preliminary decision values to all other participant devices in section 65); and

repeating the transmitting act (i.e., if no agreement is reached, broadcast signed vote for use in a fallback agreement in section 67).

Based on Corson in view of Novaes and Elliott, and further in view of Kursawe, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Kursawe to improve upon those of Corson in order to use a fault-tolerant consensus protocol to propose an action required to be coordinated with all other processors of the system.

Corson, Novaes, Elliott, and Kursawe do not teach tallying a set of votes for each candidate designated. Lisiecki, in order to provide fault-tolerance by leader election (see section 20), teaches

tallying said votes for each CCA-capable node (i.e., candidates count the number of votes that they receive in section 133 lines 38-41), and when:

one CCA-capable node receives more votes than any of the other CCA capable nodes, assigning the one CCA-capable node to become the new gateway CCA (i.e., a leader is selected as the first and only one candidate encountered with more than half of the votes in section 133 lines 38-41).

Based on Corson in view of Novaes and Elliott, and further in view of Kursawe and Lisiecki, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Lisiecki to improve upon those of Corson in order to provide fault-tolerance by leader election.

[Claim 16] Corson, Novaes, and Elliott do not teach determining if whether two-thirds of the entities participating in a vote are active. Kursawe further teaches the method further comprising

an act of determining if at least 2/3 (i.e., less than 1/3 of n participating devices may be tolerable traitors; else 2/3 of n participating devices must be honest in section 44) of the plurality of CCA-capable nodes are active (i.e.,

failure detector suspects some participant in a group as faulty in section 60 and 66), and wherein

at least 2/3 of the CCA- capable nodes must respond before performing the act of transmitting the vote (i.e., abort the verification protocol where participants send their preliminary decision values to all other participants in section 66).

Therefore, the limitations of claim 16 are rejected in the analysis of claim 15 above, and the claim is rejected on that basis.

[Claim 33] The limitations of claim 33 are similar to the limitations of claim 15. Corson does not teach the designation of a gateway. Novaes further teaches the network further comprising:

a designation instruction block in each of the CCA-capable nodes for designating one of the plurality of CCA-capable nodes to be a gateway CCA (i.e., if no network leader is specified, propose an election and choose a network leader with the highest weight in col. 15 lines 14-19).

Therefore, the limitations of claim 33 are rejected in the analysis of claim 15 above, and the claim is rejected on that basis.

[Claim 34] The limitations of claim 34 are similar to the limitations of claim 16. Therefore, claim 34 is rejected with the same reasoning as claim 16.

[Claim 51] The limitations of claim 51 are similar to the limitations of claim 15. Therefore, claim 51 is rejected with the same reasoning as claim 15.

[Claim 52] The limitations of claim 52 are similar to the limitations of claim 16. Therefore, claim 52 is rejected with the same reasoning as claim 16.

[Claim 86] The limitations of claim 86 are similar to the limitations of claim 15. Therefore, claim 86 is rejected with the same reasoning as claim 15.

[Claim 87] The limitations of claim 87 are similar to the limitations of claim 16. Therefore, claim 87 is rejected with the same reasoning as claim 16.

[Claim 96] The limitations of claim 96 are similar to the limitations of claim 15. Corson does not teach designating a gateway CCA. Novaes further teaches the CCA-capable node further comprising:

a designation instruction block for designating one of the plurality of CCA-capable nodes to be a gateway CCA (i.e., if no network leader is specified, propose an election and choose a network leader with the highest weight in col. 15 lines 14-19).

Therefore, the limitations of claim 96 are rejected in the analysis of claim 15 above, and the claim is rejected on that basis.

[Claim 97] The limitations of claim 97 are similar to the limitations of claim 16. Therefore, claim 97 is rejected with the same reasoning as claim 16.

[Claim 106] The limitations of claim 106 are similar to the limitations of claim 15. Therefore, claim 106 is rejected with the same reasoning as claim 15.

[Claim 107] The limitations of claim 107 are similar to the limitations of claim 16. Therefore, claim 107 is rejected with the same reasoning as claim 16.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHERMAN LIN whose telephone number is (571)270-7446. The examiner can normally be reached on Monday through Friday 8:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joon Hwang can be reached on 571-272-4036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/S. L./
Examiner, Art Unit 2447
5/6/2010

/Joon H. Hwang/
Supervisory Patent Examiner, Art Unit 2447